ABSTRACT OF THE DISCLOSURE

In the present invention, viruses, plasmids or both are constructed which contain viral DNA, at least one head-to-head ITR junction, and optionally, recombinase recognition sites positioned such that site-specific recombination between recombinase recognition sites in separate plasmids results in generation of infectious viral DNA at high-efficiency in cotransfected host cells that have been engineered to express a site-specific recombinase. Because of the high-efficiency and specificity of the Cre enzyme, suitably engineered plasmids can be readily recombined to produce infectious virus at high-efficiency in cotransfected 293 cells, without, at the same time, producing wild-type adenovirus, with the attendant problems for removal thereof. Use of recombinases besides Cre and recombinase recognition sites besides lox sites, and use of cells other than 293 cells are also disclosed and enabled, as are kits incorporating the site-specific vector system, as well as compositions and methods for using such compositions as vaccines or in gene therapeutic applications. Enhancements in the efficiency of both site-specific and homologous recombination are provided by inclusion of at least one head-to-head ITR junction.